OPAP AUG 23 2010 IAP19 PATENT & TRADEMARK OFFICE

Attorney Docket No.AI 423NP

IN THE UNITED STATE PATENT AND TRADEMARK OFFICE

In Re PATENT APPLICATION of:

Applicant(s): Souich Iwasa et al. Confirmation No.: 4729

Application No.: 10/587,316 Art Unit: 3611

Filed: July 26, 2006 Examiner: Anne Marie M. Boehler

For: Electric Power Steering Device

Assistant Commissioner for Patents

Washington, DC 20231

Sir:

RULE 132 DECLARATION

I, Souichi Iwasa do hereby declare the followings:

I am a citizen of Japan, residing 33 ichi-cho, Kashihara-shi, Nara 634-0008, Japan;

I graduated from the department of mechanical engineering, Kinki University Faculty of Science and Engineering, in 1987;

I was accepted for employment by Koyo Seiko Co., Ltd., presently JTEKT Corporation, in 1987. I was engaged in design development of the electric power-steering device of the subject patent application in FAVESS CO., LTD. at the time of application of the subject patent application.

I am a co-inventor of the invention disclosed and claimed in the subject patent application. I know that the office action dated February 23, 2010 has been issued which states that

the invention described in the claims of the subject patent application are unpatentable by Tsuboi (PGP 2001/5310) at view of JPA-2003-13989.

The excellent effect of the subject patent application is not acquired by Tsuboi combined with JPA-2003-13989, and also even if the interference fit produced by the usual processing variation is given.

The following Endurance Test and Evaluation Test of Auditory Quietness were conducted by myself or under my supervision. The excellent effects obtained by the subject patent application are verified by the following tests. Also the products that the subject patent application were applied thereto have been acquired great Commercial Success as described the following Secondary Consideration.

<<Endurance test>>

<Example 1>

In Example 1 corresponding to the embodiment of Fig.5 of the subject patent application, the design value of the first interference fit d1 of the engagement arm of an elastic member is 0.675 mm, and the design value of the second interference fit d2 is 0.175 mm. Each of the design tolerances of the interference fits in Example 1 is ±0.05mm.

<Comparative Example 1>

In Comparative Example 1, each of the design values of the interference fits of engagement arms of the elastic member is 0.175 mm .(d1 =d2= 0.175mm) Each of the design tolerances

of the interference fits in Comparative Example 1 is±0.05mm.

<Test Condition>

Endurance test on the bench was carried out using Example 1 of the subject patent application, and Comparative Example 1 which has the elastic member of the interference fit as usual. With the electric power steering device operating, an operation of rotating the steering member (steering wheel) connected to the electric power steering device, by 540 degrees to the left from the neutral position, then rotating the steering wheel back to the neutral position, then rotating the steering wheel by 540 degrees to the right from the neutral position, and thereafter rotating back to the neutral position was performed as one cycle, and predetermined endurance cycles were repeated continuously to perform the endurance test.

Before endurance test, width dimensions of the six engagement arms of the elastic member were measured in each of Example 1 and Comparative Example 1. After each of ends of the predetermined endurance cycles, width dimensions of the six engagement arm of the elastic member were measured in each of Example 1 and Comparative Example 1.

<Endurance Test Result>

(Example 1)

The relation of number of endurance cycles and the ranges of measured values of width dimensions in Example 1 is shown in Fig.1. A first average value among the measured values of the width dimensions which were measured before the endurance

test is shown by a thick solid line in Fig.1. A second average value among all measured values of the width dimensions which were measured during the endurance test is shown by a one-dot chain line in Fig.1.

The first average value among the measured values before the endurance test was about 7.3 mm as shown in Fig.1. The second average value among all measured values during the endurance test was about 6.7 mm as shown in Fig.1. The difference between the first average value (about 7.3 mm) before the endurance test and the second average value (about 6.7 mm) during the endurance test corresponds to average of creep amounts of the engagement arms. The average of creep amounts were about 0.6 mm in Example 1.

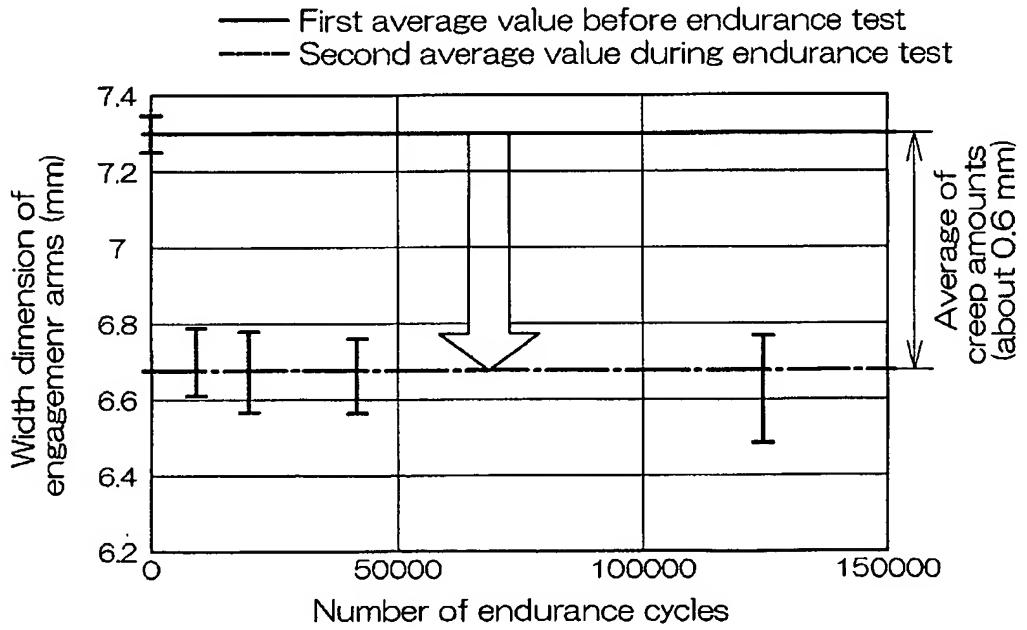

Fig. 1 Creep amount of engagement arms of an elastic member in Example 1
(Interference condition: d1=0.675 mm, d2=0.175mm)

(Comparative Example 1)

The relation of number of endurance cycles and the ranges of measured values of width dimensions in Comparative Example 1 is shown in Fig.2. A first average value among the measured values of the width dimensions which were measured before the endurance test is shown by a thick solid line in Fig.2. A second average value among all measured values of the width dimensions which were measured during the endurance test are shown by a one-dot chain line in Fig.2.

The first average value among the measured values before the endurance test was about 7.2 mm as shown in Fig.2. The second average value among all measured values during the endurance test was about 6.3 mm as shown in Fig.2. The difference between the first average value (about 7.2 mm) before the endurance test and the second average value (about 6.3 mm) during the endurance test corresponds to average of creep amounts of the engagement arms. The average of creep amounts was about 0.9 mm in Comparative Example 1.

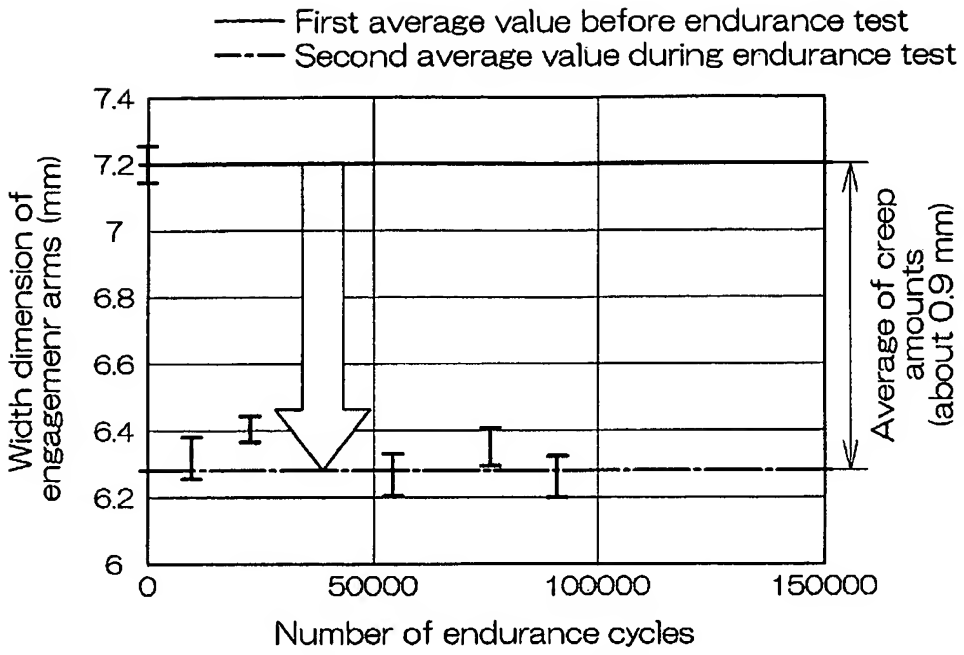

Fig. 2 Creep amount of engagement arms of an elastic member in Comparative Example 1 (Interference condition: d1=d2=0.175mm)

(Conclusion)

The average of creep amounts was about 0.6 mm in Example 1. The average of creep amounts was about 0.9 mm in Comparative Example 1. The Example 1 of the subject patent application was able to reduce the average of creep amount of the elastic member 33% as compared with the Comparative Example 1.

<<Evaluation Test of Auditory Quietness>>

When the Example 1 and the Comparative Example 1 were carried in vehicles, respectively, the quietness on auditory feeling was evaluated on a scale of 1-10. The vehicle which carried the Comparative Example 1 was 6 in the evaluation of quietness on auditory feeling. On the other hand, the vehicle which

carried the Example 1 was 7.5 in the evaluation of quietness on auditory feeling. The evaluation of quietness on auditory feeling of the Example 1 is high 25% as compared with the Comparative Example 1.

<<Secondary Consideration>>

The products to which the subject patent application was applied have obtained the following commercial success. As for the above products, improvement in performance has been accepted in customers such as Daimler-Benz. As a result, about 400,000 above products have been supplied to the customer by the present from May, 2004 every year.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: August 18, 2010 By: S. IWASA

Souichi Iwasa